

FIGURE 1-A

PROTEIN	DESCRIPTION	REFERENCE ¹	mRNA/gene Sequence ²
Voltage-Gated Ion Channel	K ⁺ channel beta 1a subunit	Hs.45090	U33428 L39833 L47665
Sodium Channel	Voltage dependant sodium channel		
Calcium Channel	Dihydropyridine-Sensitive L-type, Calcium Channel Beta-1-B1 Subunit	Hs.635	L0611 M92392 M76560
	Dihydropyridine-sensitive L-type calcium channel alpha-1 subunit (CACNL1A3),	Hs.1294	L33798 U30707
	Neuronal DHP-sensitive, voltage-dependent, calcium channel alpha-2b subunit	Hs.1295	M76559
	Dihydropyridine-sensitive l-type, skeletal muscle calcium channel gamma subunit	Hs.1296	L07738 Z19603
	Neuronal DHP-sensitive, voltage-dependent, calcium channel alpha-1D subunit	Hs.23838	M76558 M83556 D43747
	Putative calcium influx channel (htrp3)	H.24852	U47050 Y13758
	Voltage-dependent calcium channel alpha-1 E-3	Hs.65441	L29385 L29384 L27745
	N-type calcium channel alpha- subunit	Hs.69949	M94172 M94173
	Voltage-dependent L-type Ca channel alpha 1 subunit	Hs.89925	L29536 L29534 M92269

¹ Genbank reference designation for protein. Proteins with no designation are referenced in this text.
² Genbank mRNA or gene sequence reference designation.

FIGURE 1-B

PROTEIN	DESCRIPTION	REFERENCE	mRNA/gene Sequence
Ligand-Gated Channel	Gamma-amino butyric acid (GABA) receptor		
G-Coupled Receptor	Nicotinic Acetylcholine Receptor	Hs.16362	AF007891 U52464
	P2Y6 receptor		
	Chemokine (C-C) receptor 7	Hs.784	L08177
	Human RPE-retinal G protein-coupled receptor	Hs.1544	U14910
	Inwardly rectifying potassium channel Kir3.2	Hs.11173	U52153 D87327 U24660
	G protein-coupled receptor kinase GRK4	Hs.32859	L03718 U33054
	G protein-coupled inwardly rectifying potassium channel Kir3.4	Hs.37168	U52154
	G protein-activated inwardly rectifying potassium channel HGIRK1/Kir3.1	Hs.37169	U50964
Receptor-Gated Channel	Fc fragment of IgE, high affinity I, receptor for; beta polypeptide	Hs.30	M89796
	Interleukin 2 receptor gamma chain	Hs.84	L19546
	Cholecystokinin A receptor	Hs.129	L13605 L19315
	Peripheral-type benzodiazepine receptor	Hs.202	M36035
	Cholecystokinin B receptor	Hs.203	L07746 L10822
	Glucagon receptor	Hs.208	L20316
	Serine/threonine-protein kinase receptor R4 precursor	Hs.220	L11695
	Formyl peptide receptor-like 1	Hs.251	M84562 M88107
	Adenosine receptor A3	Hs.258	L20463 L22607

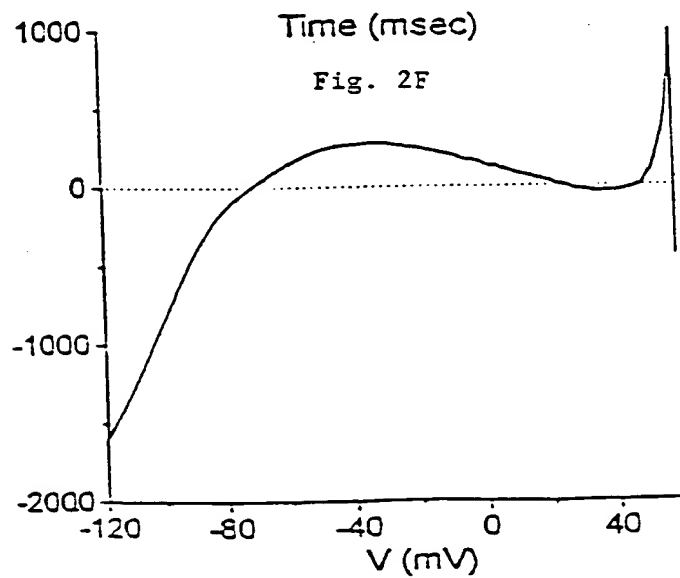
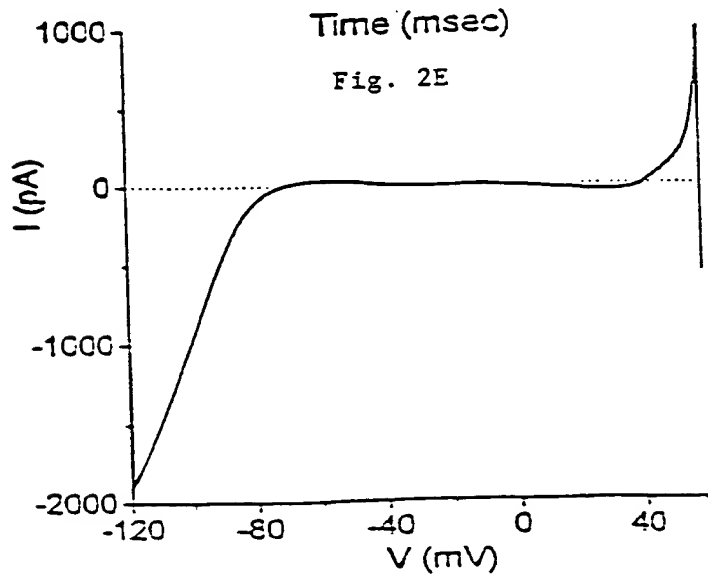
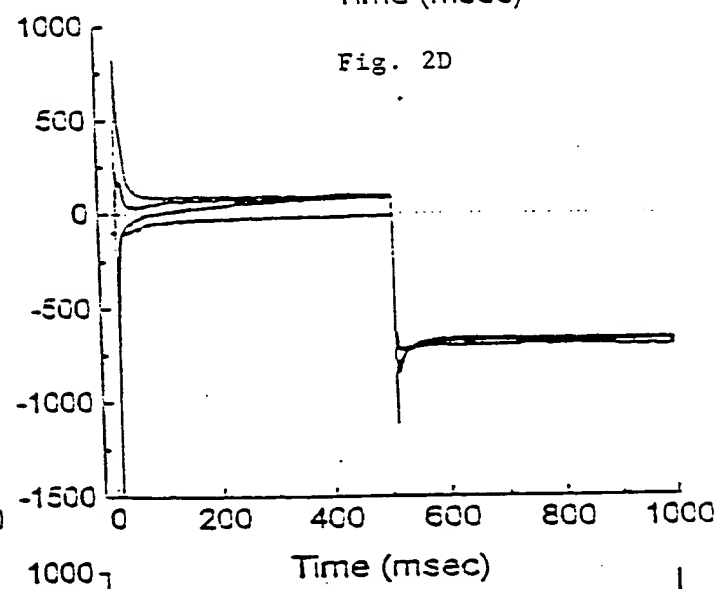
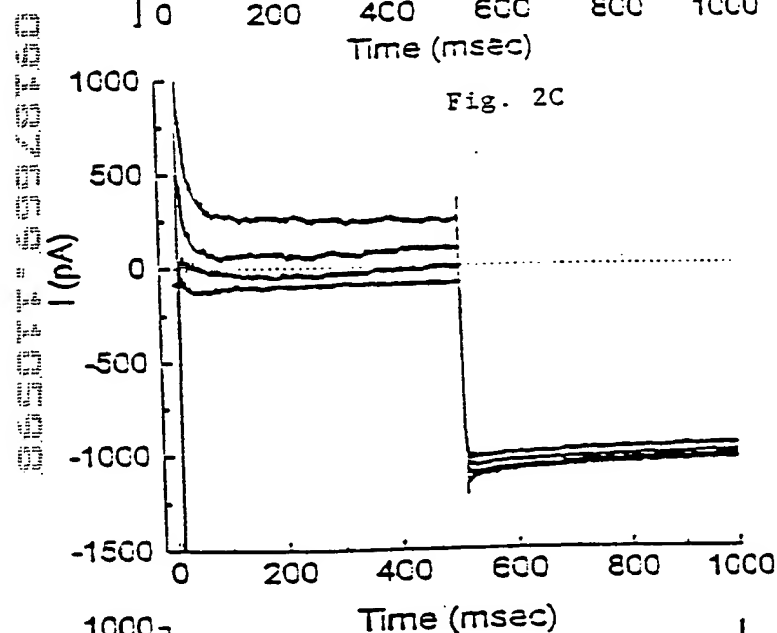
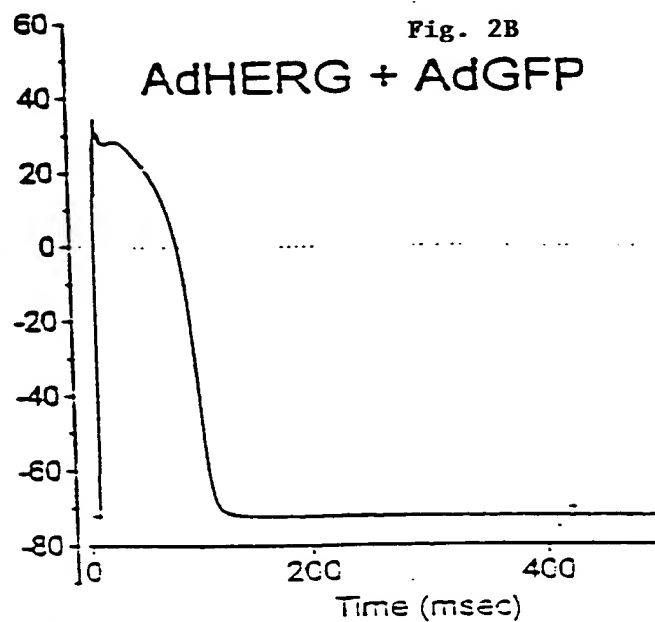
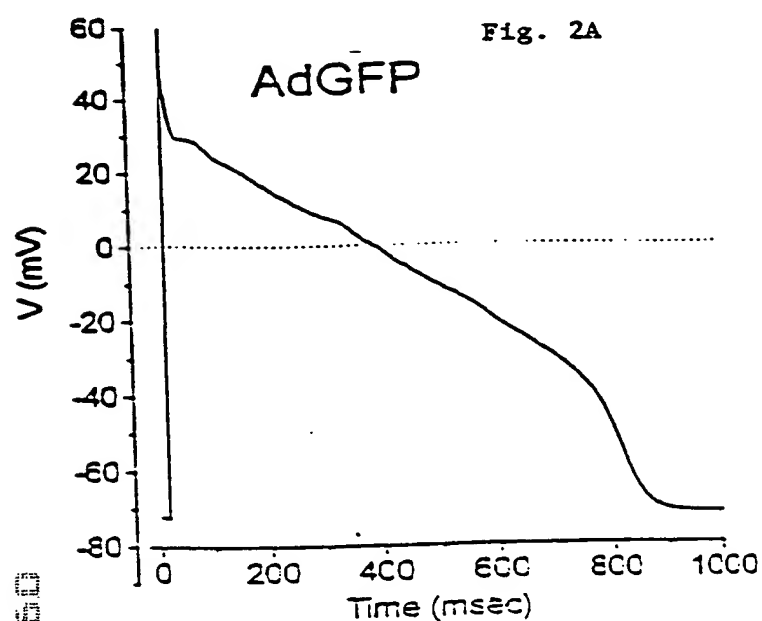
FIGURE 1-C

PROTEIN	DESCRIPTION	REFERENCE	mRNA/gene Sequence
Growth Factor Receptor	Pleiotrophin (heparin binding growth factor 8, neurite growth-promoting factor 1)	Hs.44	M57399
	Hepatocyte growth factor activator precursor	Hs.104	D14012
	Fibroblast growth factor 9 (glia-activating factor)	Hs.111	D14838
	Insulin-like growth factor binding protein 2	Hs.162	M35410
	Human growth factor receptor tyrosine kinase (STK-1)	Hs.385	U02687
Kinase	Proto-oncogene c-cot (protein-serine/threonine kinase)	Hs.248	D14497
	Receptor protein-tyrosine kinase sky	Hs.301	U18934
			D17517
	Calcium/calmodulin-dependent protein kinase IV	Hs.348	D30742
			L24959
	Creatine kinase B	Hs.669	M16451
			L47647
	V-raf murine sarcoma viral oncogene homolog B1	Hs.622	M95712
Transferase	Glucosaminyl (N-acetyl) transferase 1, core 2	Hs.781	M97347
			L41415
	Glutathione S-transferase, microsomal	Hs.790	J03746
	UDP glucosyltransferase 8 (UDP-galactose ceramide galactosyltransferase)	Hs.57700	U30930
			U62899
Isomerase	Peptidylprolyl isomerase B (cyclophilin B)	Hs.699	
	3-Beta hydroxy-5-ene steroid dehydrogenase type II	Hs.825	M67466
			N77144
	Glucose phosphate isomerase	Hs.944	K03515
	Hydroxy-delta-5-steroid dehydrogenase, 3-beta- and steroid delta-isomerase 1	Hs.38586	M27137
			M38180
Protease	26S protease regulatory subunit 4	Hs.548	L02426
	Hepsin	Hs.823	M18930
	Granzyme B precursor	Hs.1051	M17016
Dehydrogenase	Glycine cleavage system protein P (glycine decarboxylase)	Hs.27	M64590
	17 beta hydroxysteroid dehydrogenase, type 2	Hs.181	L11708

FIGURE 1-D

PROTEIN	DESCRIPTION	REFERENCE	mRNA/gene Sequence
Dehydrogenase	Xanthine dehydrogenase	Hs.250	D11456
	Alcohol dehydrogenase 7 sigma subunit (class IV)	Hs.389	U09623 U07821
	Succinate dehydrogenase 2, flavoprotein (Fp) subunit	Hs.469	D30648 L21936
		Hs.34	L09229
Synthetase	Long chain fatty acid acyl-coA ligase	Hs.754	M98045
	Folypolyglutamate synthetase	Hs.1673	M90656
	Glutamate-cysteine ligase (gamma-glutamylcysteine synthetase), catalytic		
	Hydroxymethylbilane synthase	Hs.82609	M95623
Deaminase	Dipeptidylpeptidase IV (CD26, adenosine deaminase complexing protein 2)	Hs.44926	M80536
	Deoxycytidylate deaminase	Hs.76894	L12136
	AMP deaminase 2	Hs.82927	U16270
	Adenosine monophosphate deaminase (isoform E)	Hs.83918	M84721
Oncogene	V-crk avian sarcoma virus CT10 oncogene homolog	Hs.16	D10656
	Thyroid hormone receptor, alpha (avian erythroblastic leukemia viral (v-erb-a) oncogene homolog)	Hs.724	M24899
	Friend leukemia virus integration 1		
	RAP1A, member of RAS oncogene family	Hs.736	M98833
	Thrombopoietin (myeloproliferative leukemia virus oncogene ligand, megakaryocyte growth and development factor)	Hs.865	M22995
		Hs.1166	L36051
	Fibroblast growth factor 4 (heparin secretory transforming protein 1, Kaposi sarcoma oncogene)	Hs.1755	J02986 M17446
	V-erb-a avian erythroblastic leukemia viral oncogene homolog-like 4	Hs.1939	L07868
Fos	P55-c-fos proto-oncogene protein	Hs.25647	V01512
Jun	C-jun proto oncogene (JUN)	Hs.78465	J04111
	Jun B proto-oncogene	Hs.89792	M29039

Canine LV myocytes infected with dGFP or AdHERG



Schematic

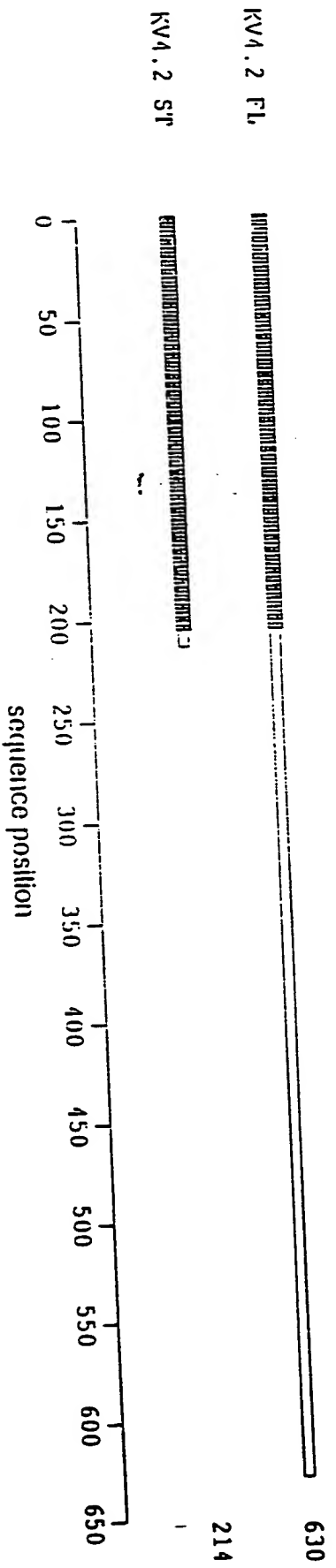


Fig. 3A

09487669 110593

Alignment

KV1.2 FL
KV1.2 STKV4.2 F1,
KV4.2 S1

13
14
15

KV4.2 57

KV4.2 F1.
KV4.2 S1'KV4.2 Fl,
KV4.2 S1'KV4.2 FL
KV4.2 STKV4.2 Fl,
KV4.2 S1"KV4.2 FL
KV4.2 5'1"

60
60

119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

180
180
100

240
 214

 lveyl lrlaapstye fvrsvms lldval lpyiql vmtchuevga fvl lvrfrl

 300
 214

 Ekf8rhsgqlrllytLkscaseJfllfslunallfntvmfyaekgsaskfcsJpaa

fwytltvmttlygydmvpkltiagkltfsgtsclysvlvialpvpvtvsnfstrlybqngrad	420
-----	214

krraqkarrlarlaaksysanaymgskrngllsngllqasdebafovskysafeltqhh

400
214

11hclektlnhefvdeqvfceescmevalvnrpslspstssqgvltalcgarlhkkkfrl	540

11hclektlnhefvdeqvfceescmevalvnrpslspstssqgvltalcgarlhkkkfrl	214

KV4.2 FL	pnauvsghrgsvqelstliqlrcvertplnsrsslhakneecvklinceqpyvltalisl	600
KV4.2 ST	-----	214

KV4.2 FL	plppvltlpeqddrpespeysqgnlvrsal	630
KV4.2 ST	-----	214

A

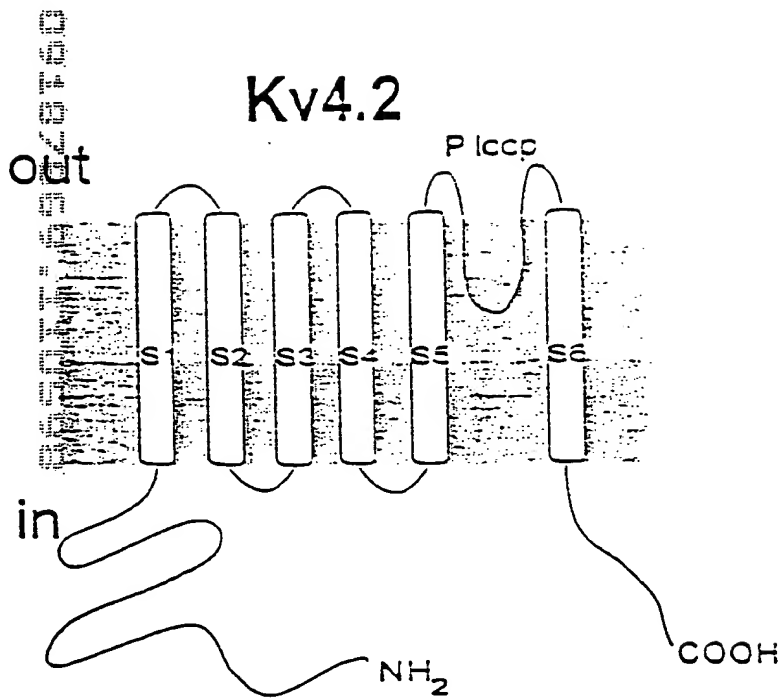


Fig. 4A

Kv4.2ST

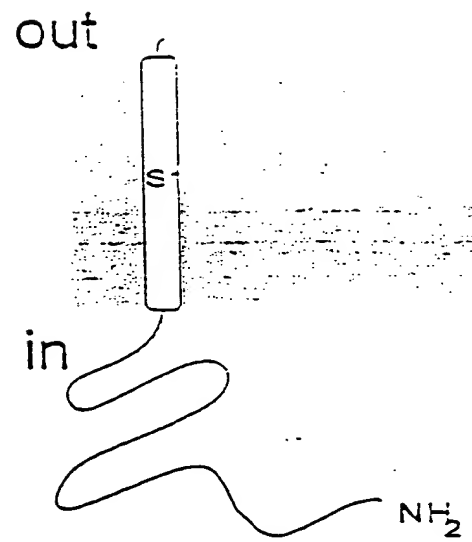


Fig. 4B

064766 14555

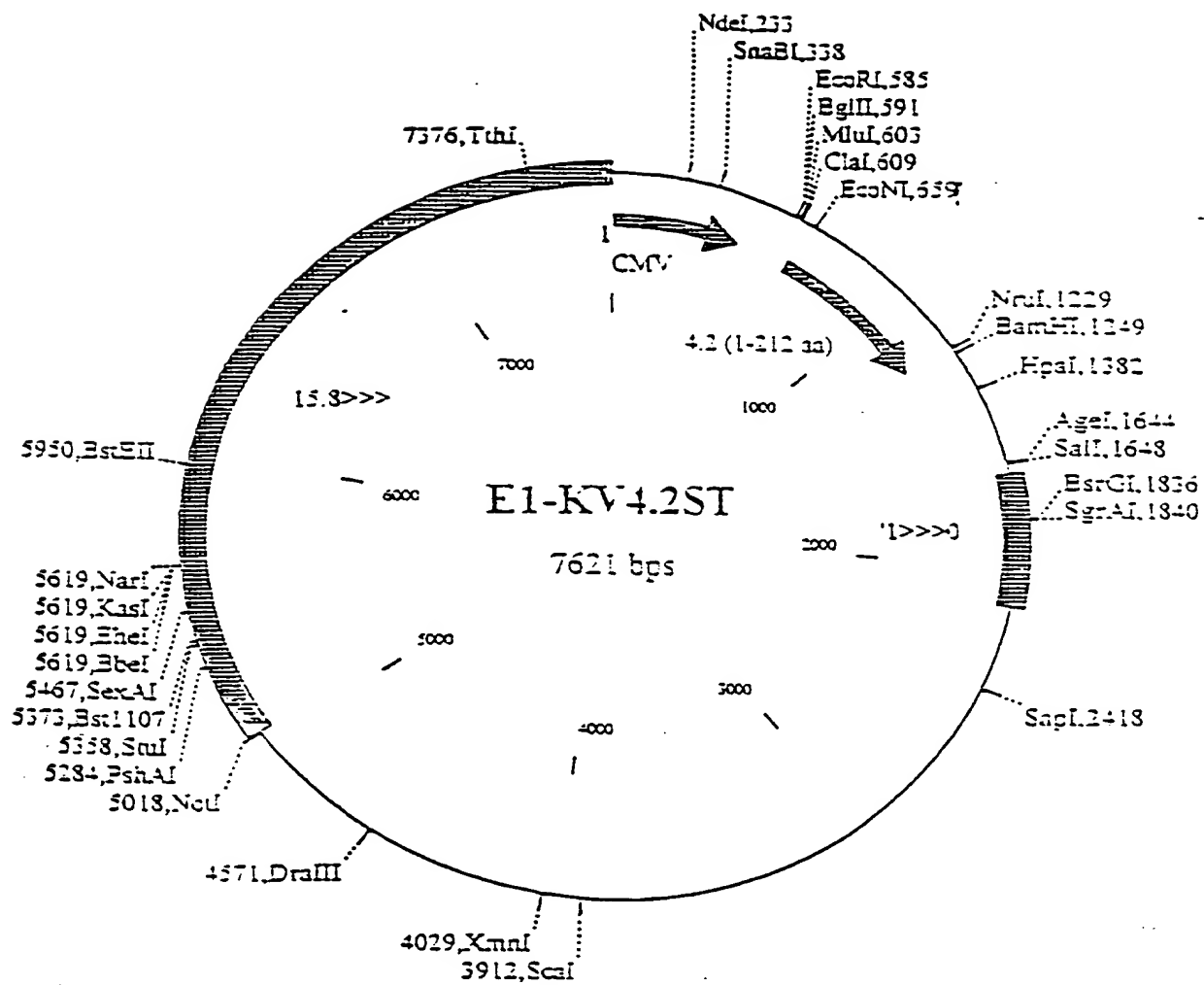


Fig. 5

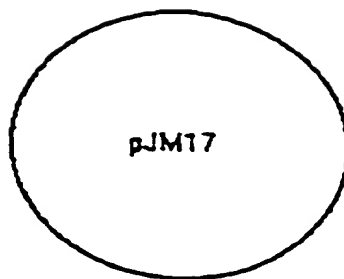
ClaI,915
XbaI,1537
SalI,2756
BamHI,5032
ClaI,3384
EcoRI,3409
pBRX
XbaI,5708
SexAI,7732
SalI,13831
SalI,14210
PmeI,17622
SalI,21113
SgrI,25805
BamHI,25929
SpeI,31449
EcoRI,31698
SrrI,31894
10000
20000
30000
40000
10000
20000
30000
40000
PJM17
40072 bps

Fig. 6



pE1-Kv4.2ST

+



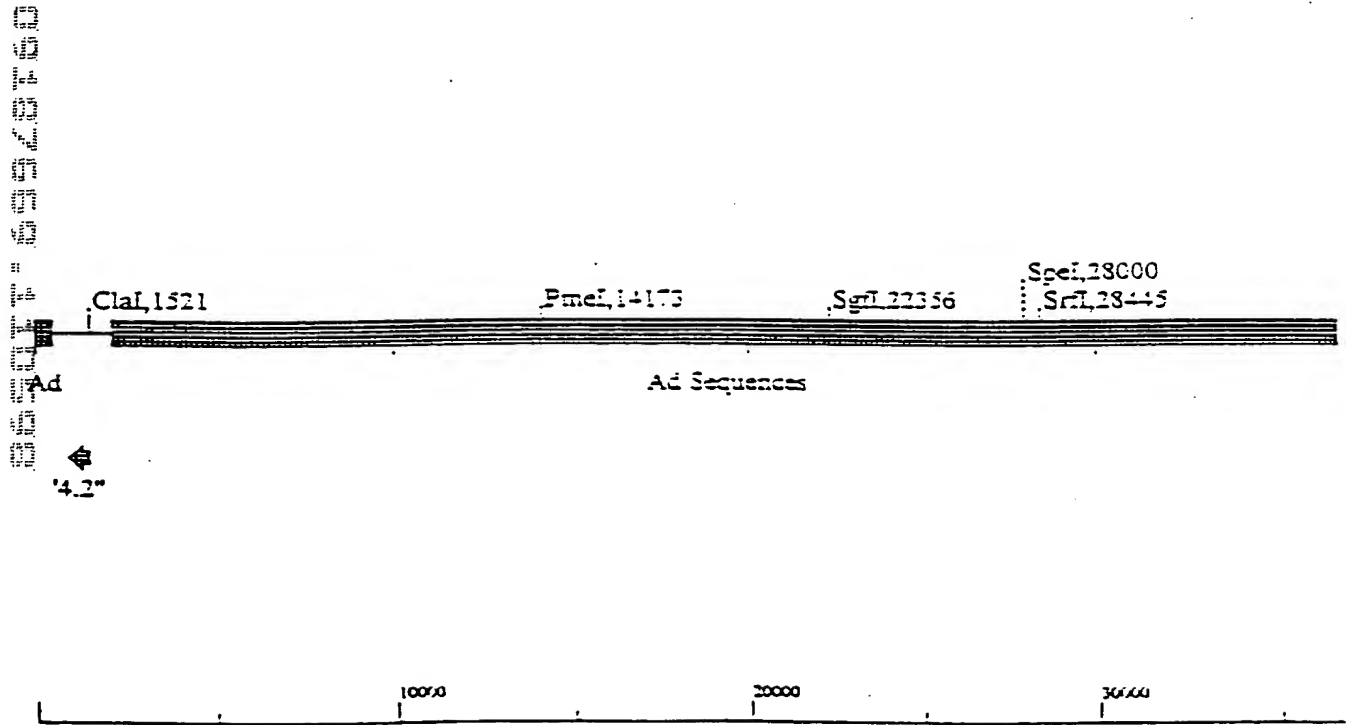
pJM17



AdKv4.2ST

Fig. 7A

bioRxiv preprint doi: <https://doi.org/10.1101/032260>; this version posted March 1, 2016. The copyright holder for this preprint (which was not certified by peer review) is the author/funder, who has granted bioRxiv a license to display the preprint in perpetuity. It is made available under aCC-BY-NC-ND 4.0 International license.



Ad42ST (36623 bps)

Fig. 7B

1 2 3 4 5 6 7 8 9 10

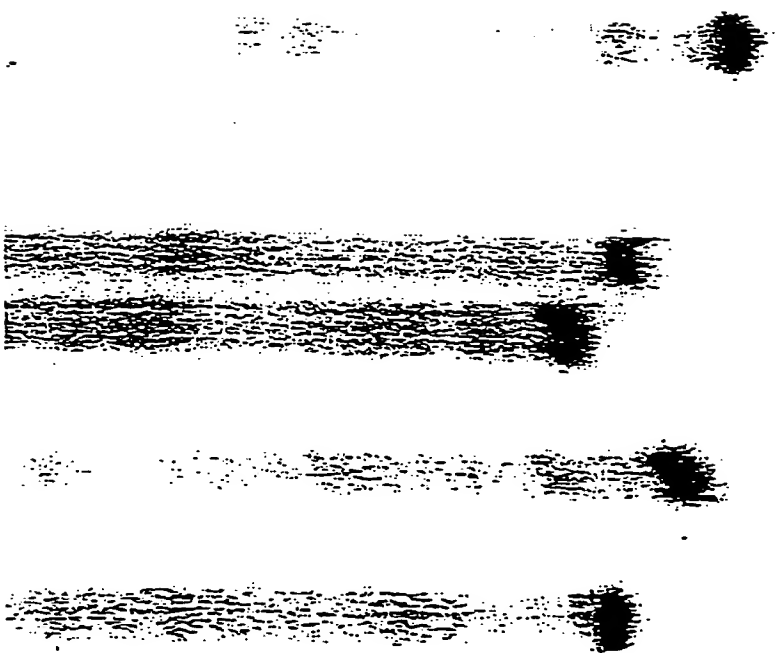


Fig. 8

00407000 140590

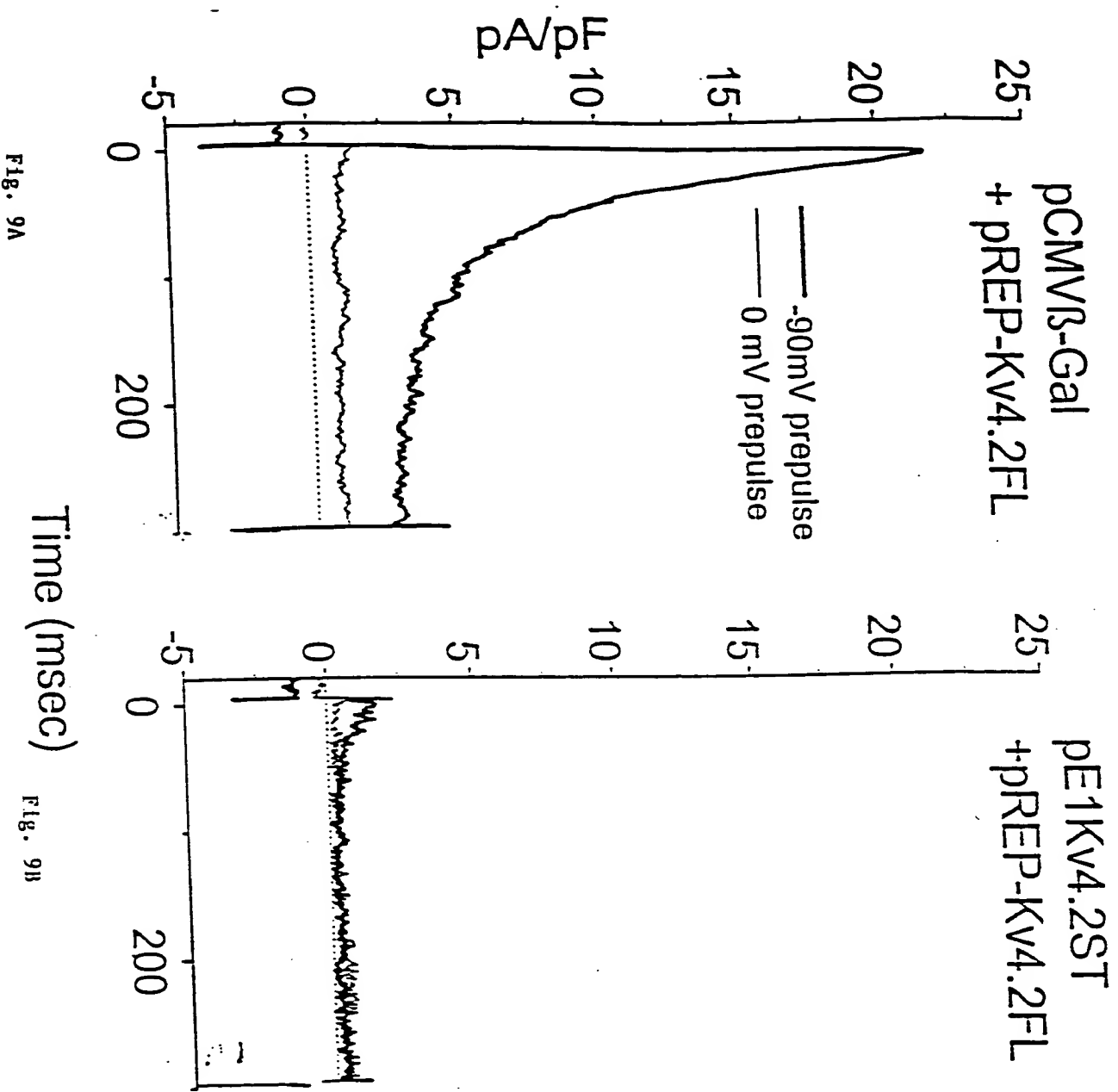


Fig. 9A

Fig. 9B

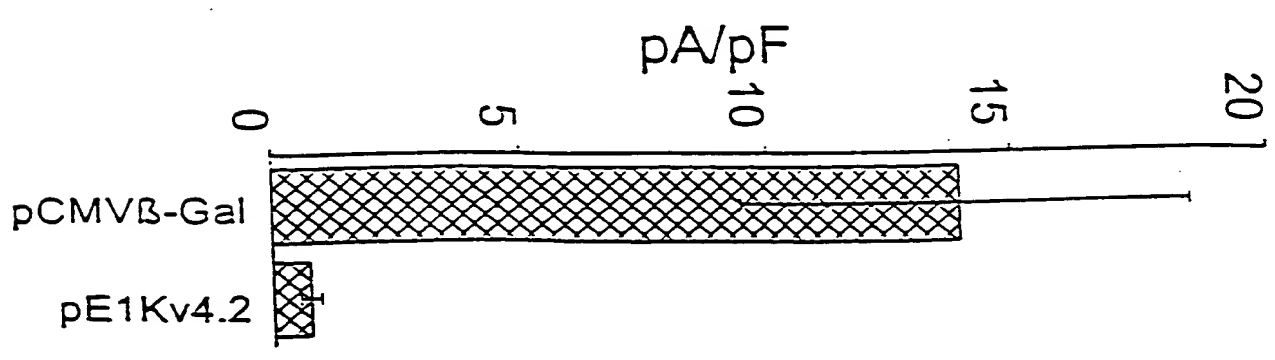


Fig. 9C

09187669 110598

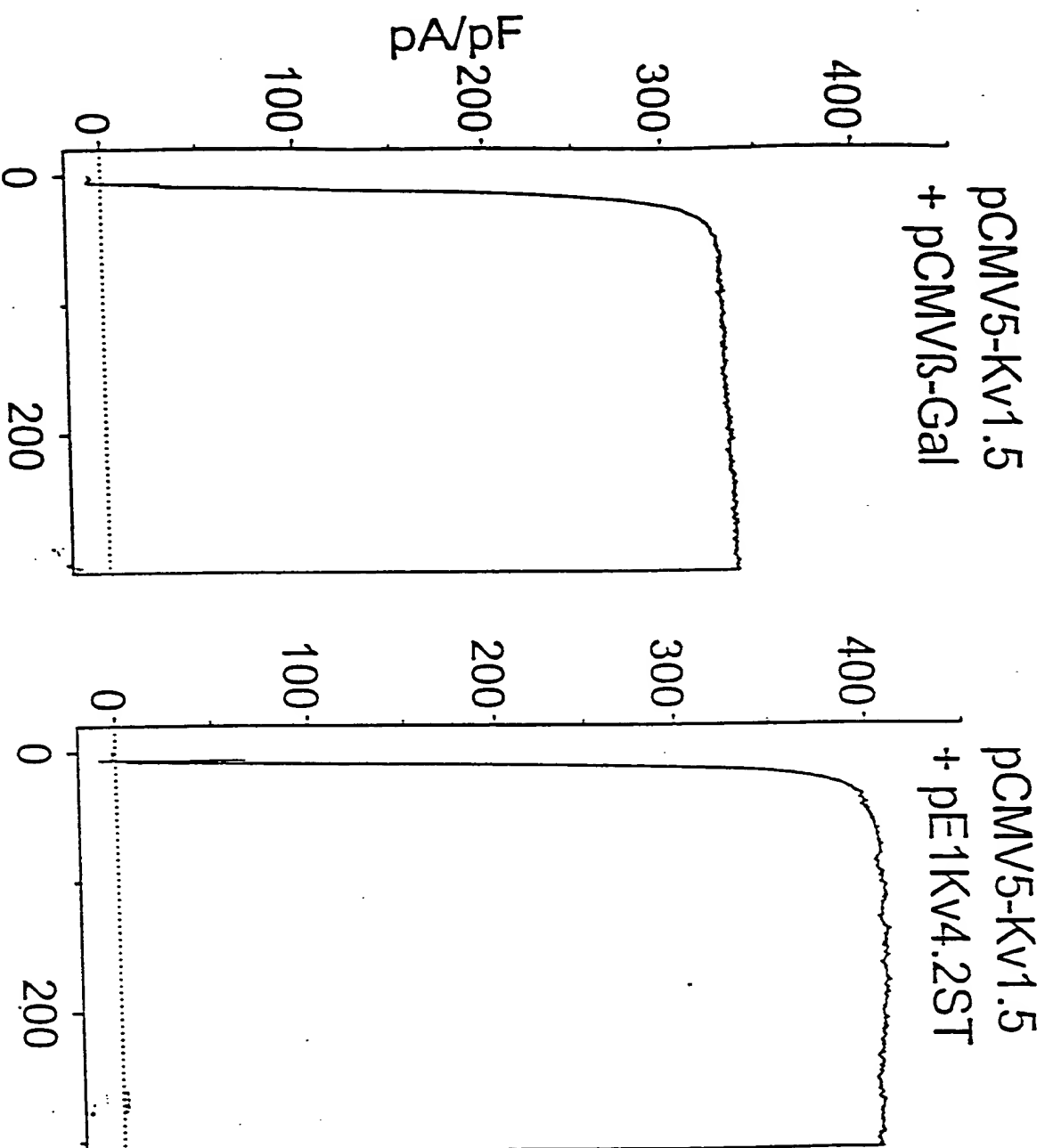


Fig. 9D

Time (msec)

Fig. 9E

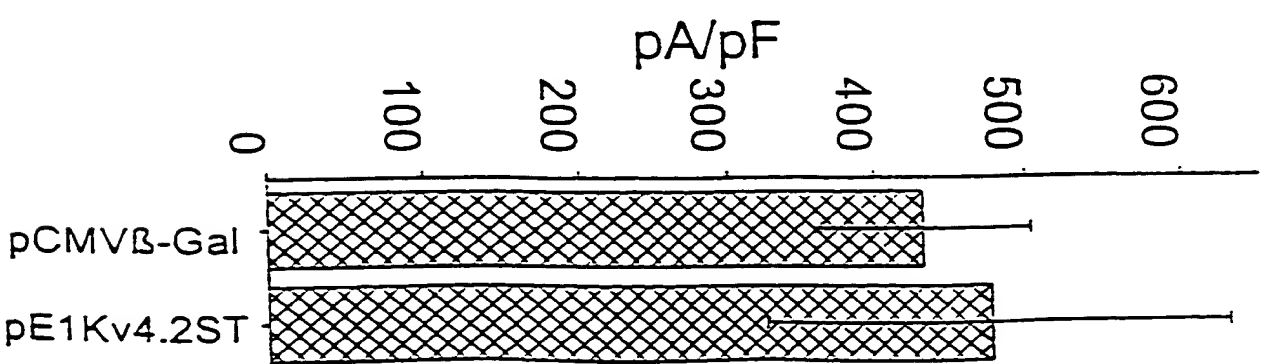


Fig. 9F



Bela Gal

Fig. 10B

Fig. 11A

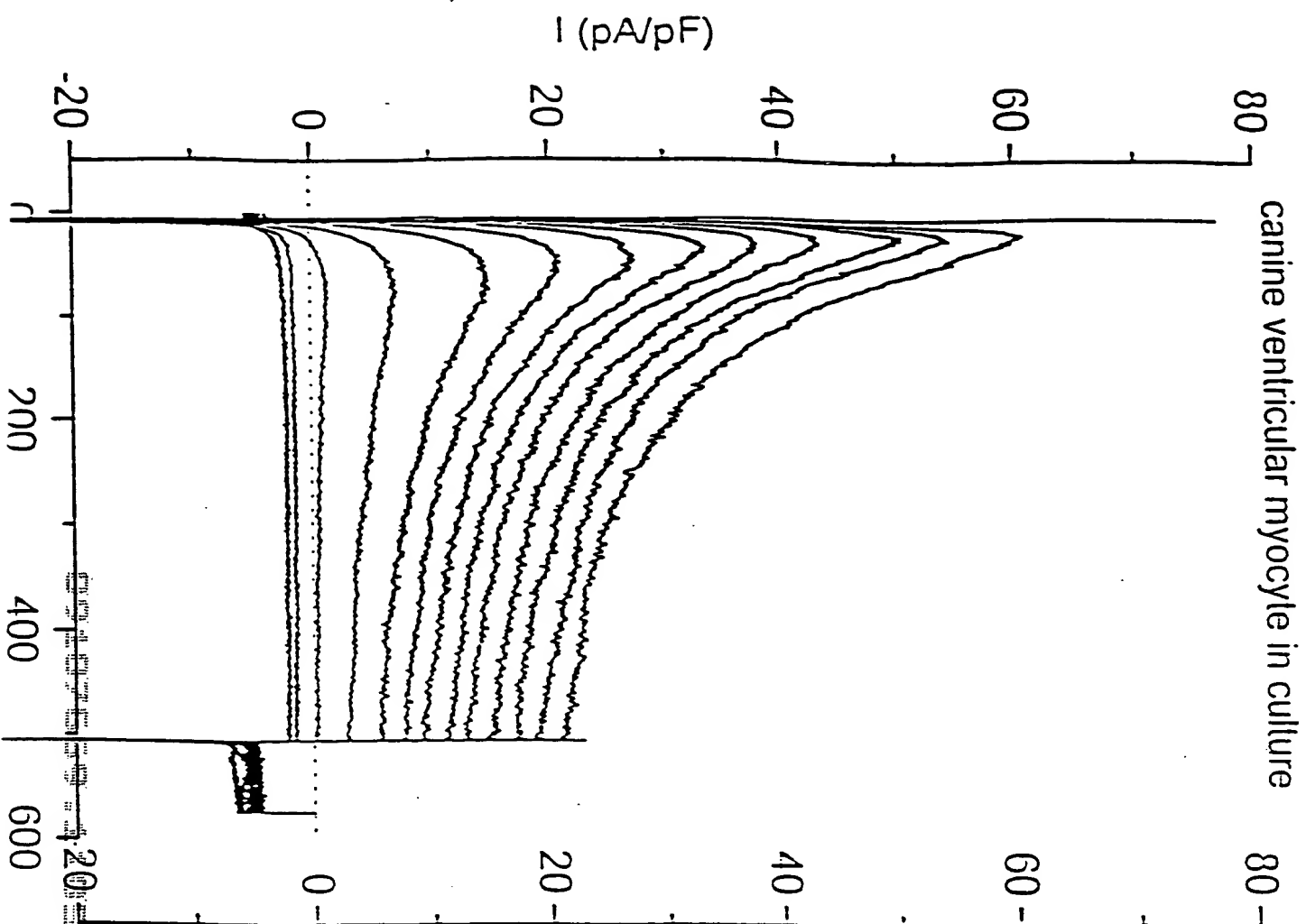
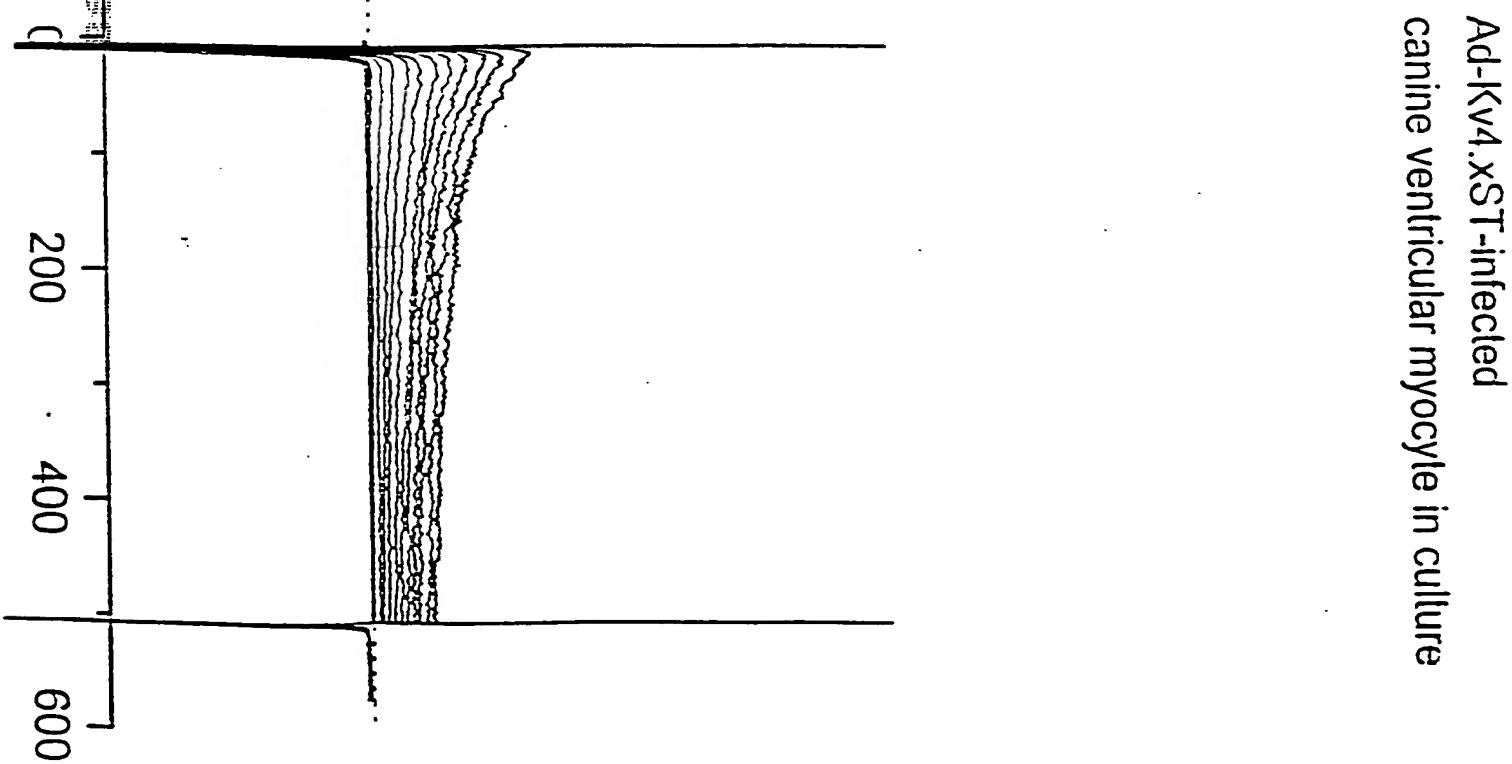
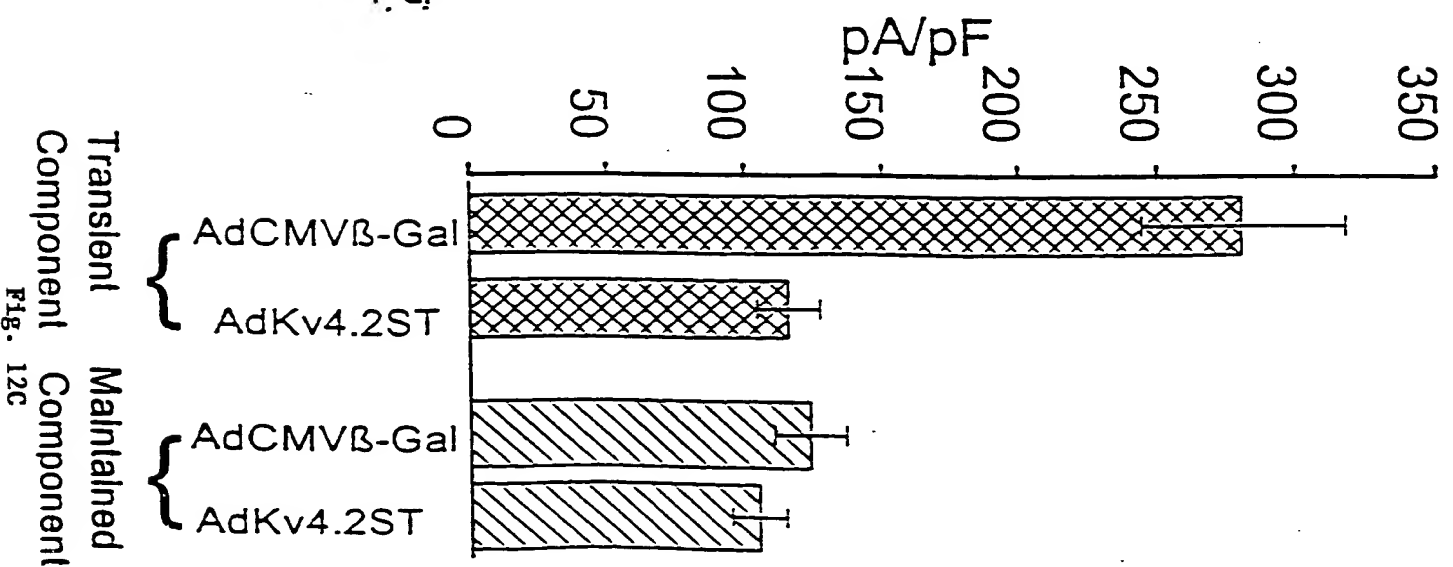
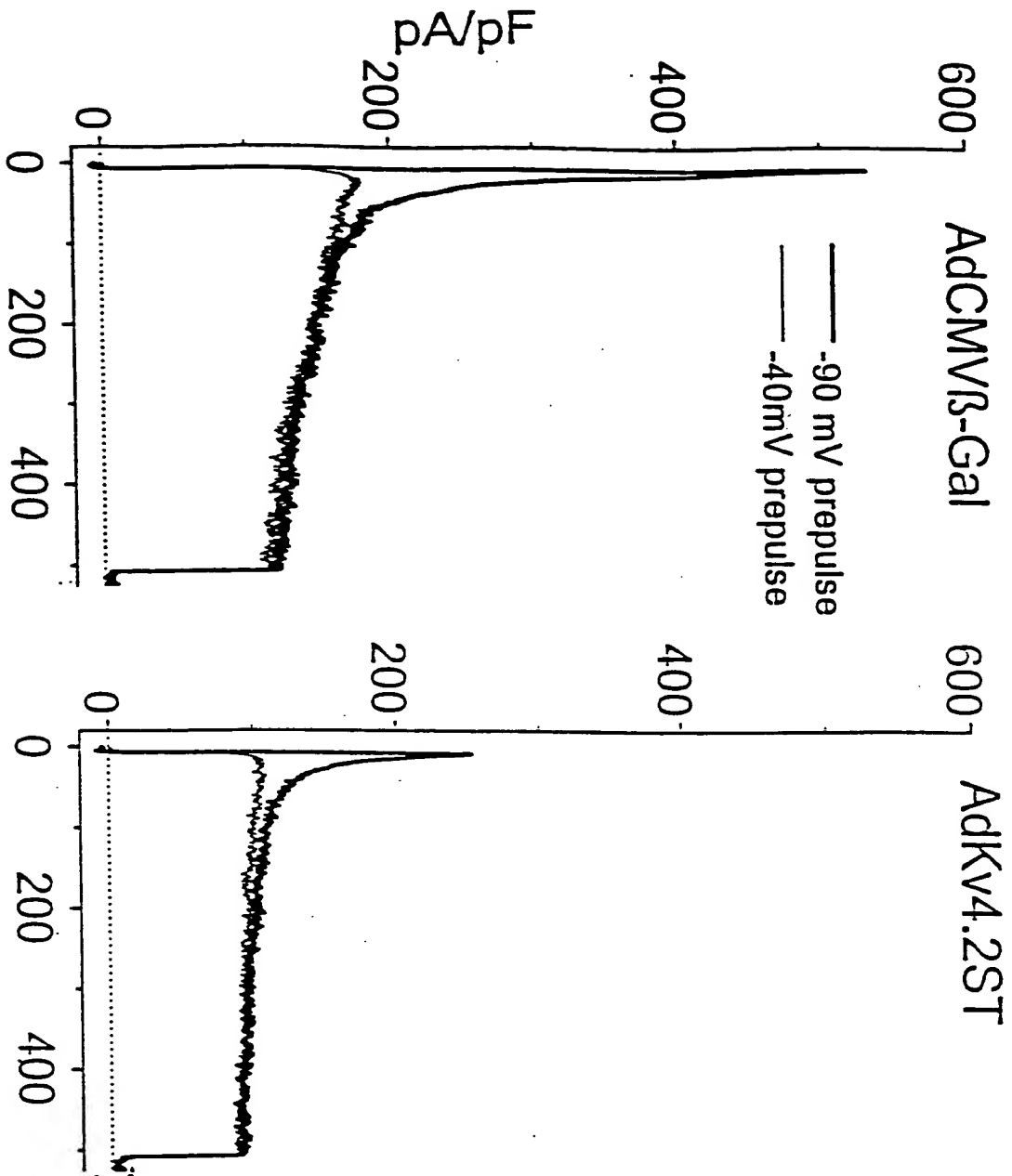


Fig. 11B





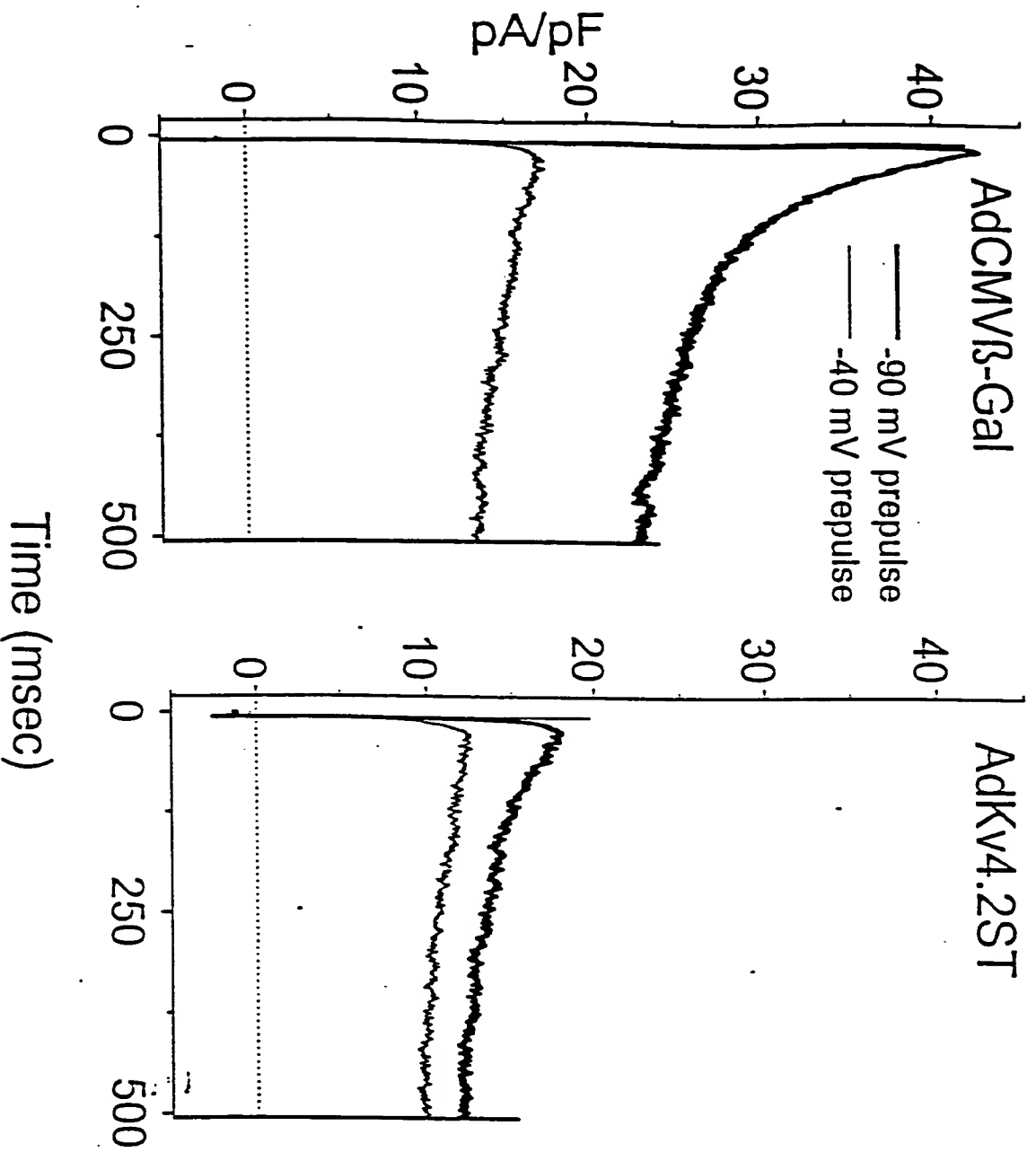


Fig. 13A

Fig. 13B

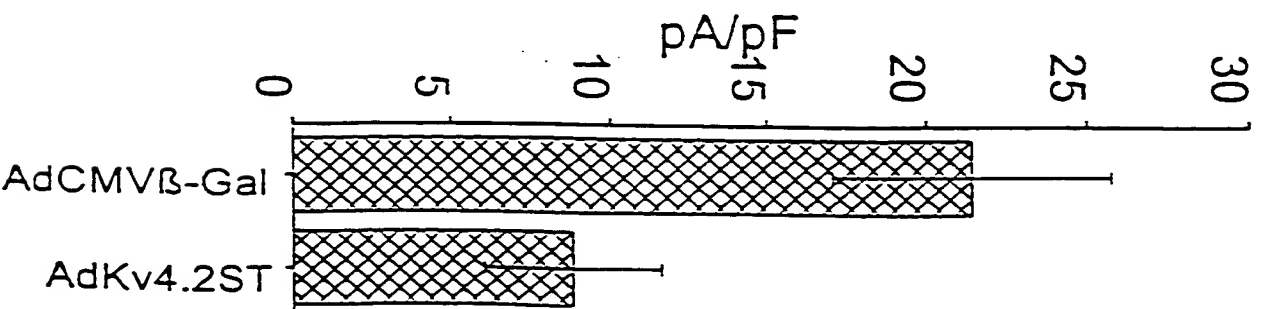


Fig. 13C

09437669-4405916

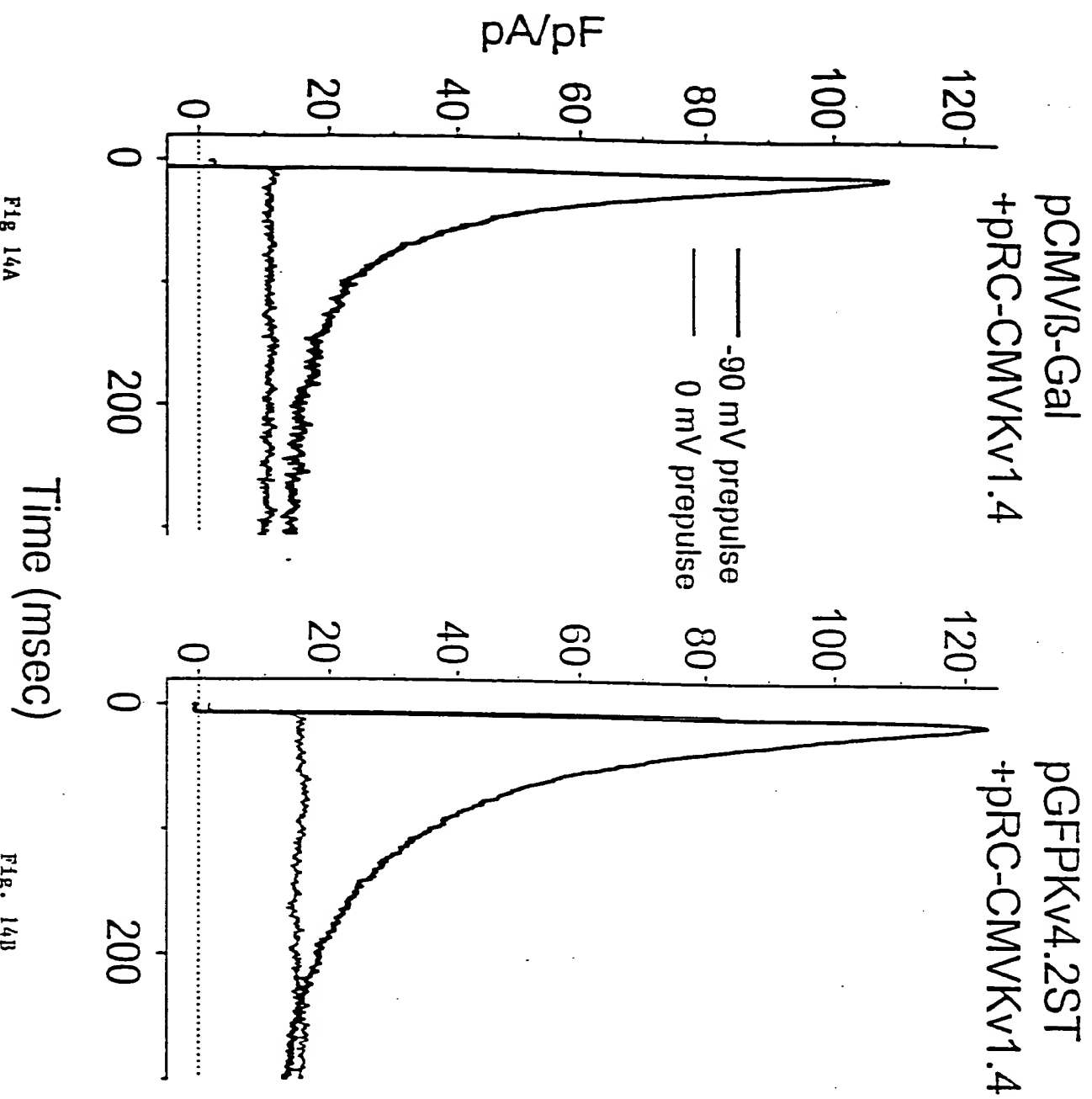


Fig. 14A

Fig. 14B

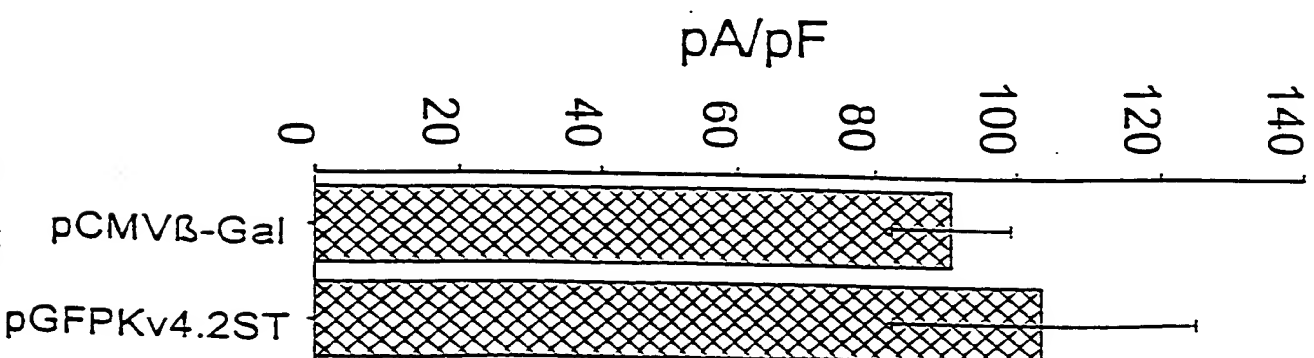


Fig. 14C

09187669 440598

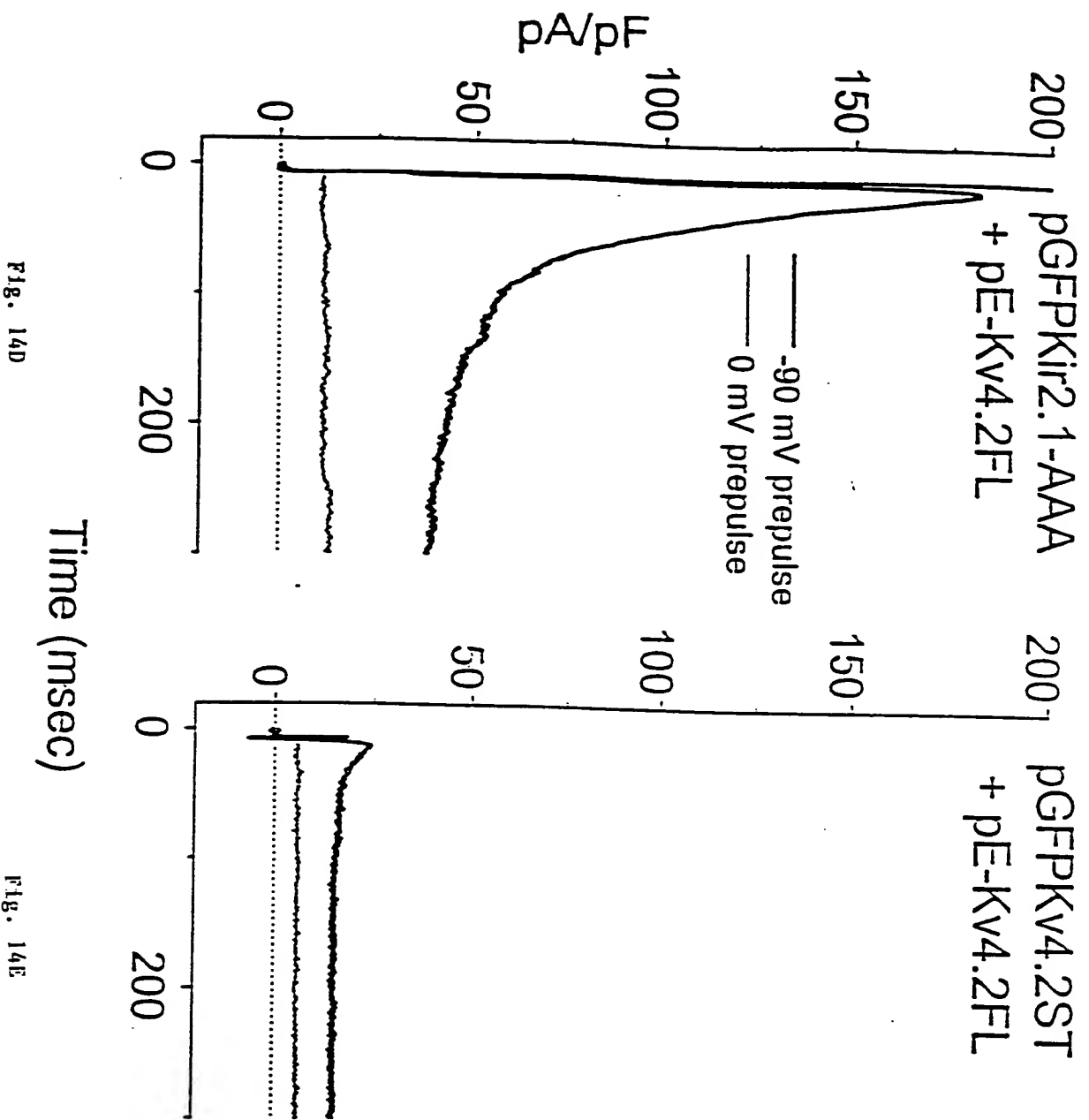


Fig. 14D

Fig. 14E

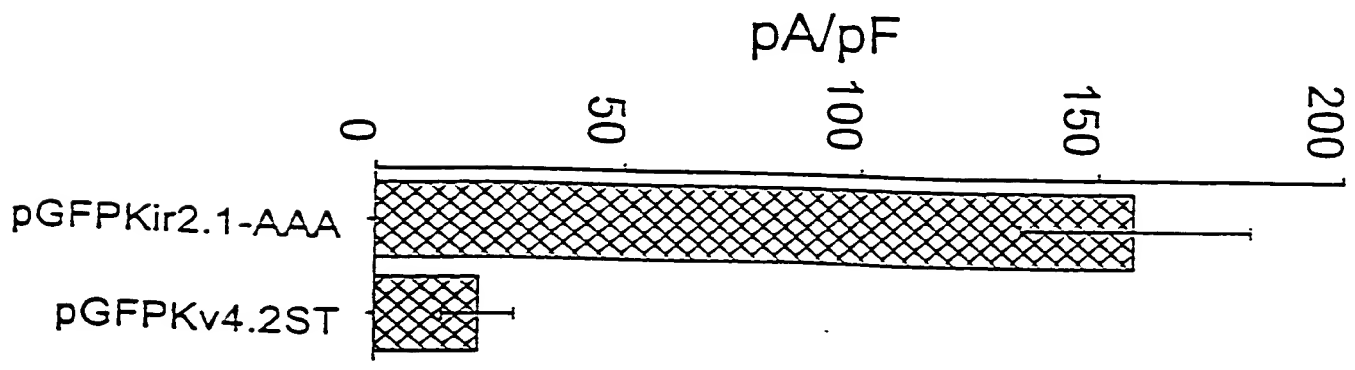


Fig. 14F

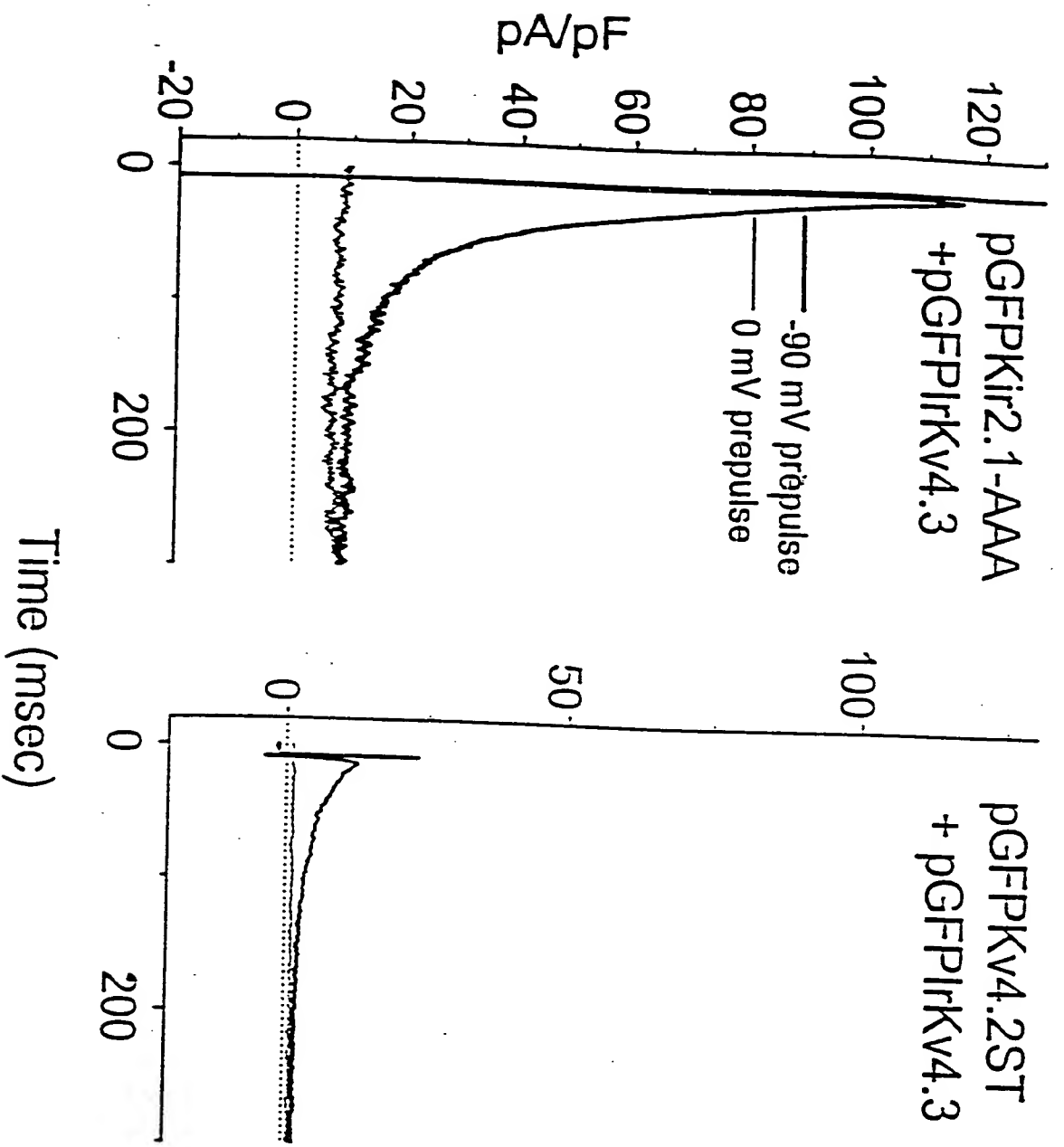


Fig. 14G

Fig. 14H

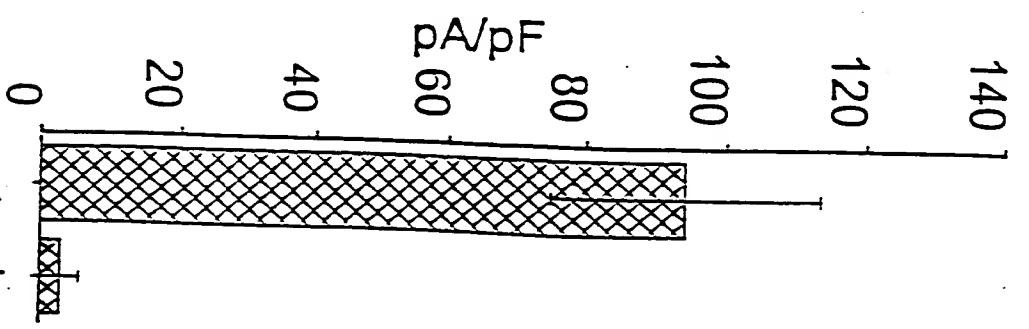


Fig. 14I

09487669.110598

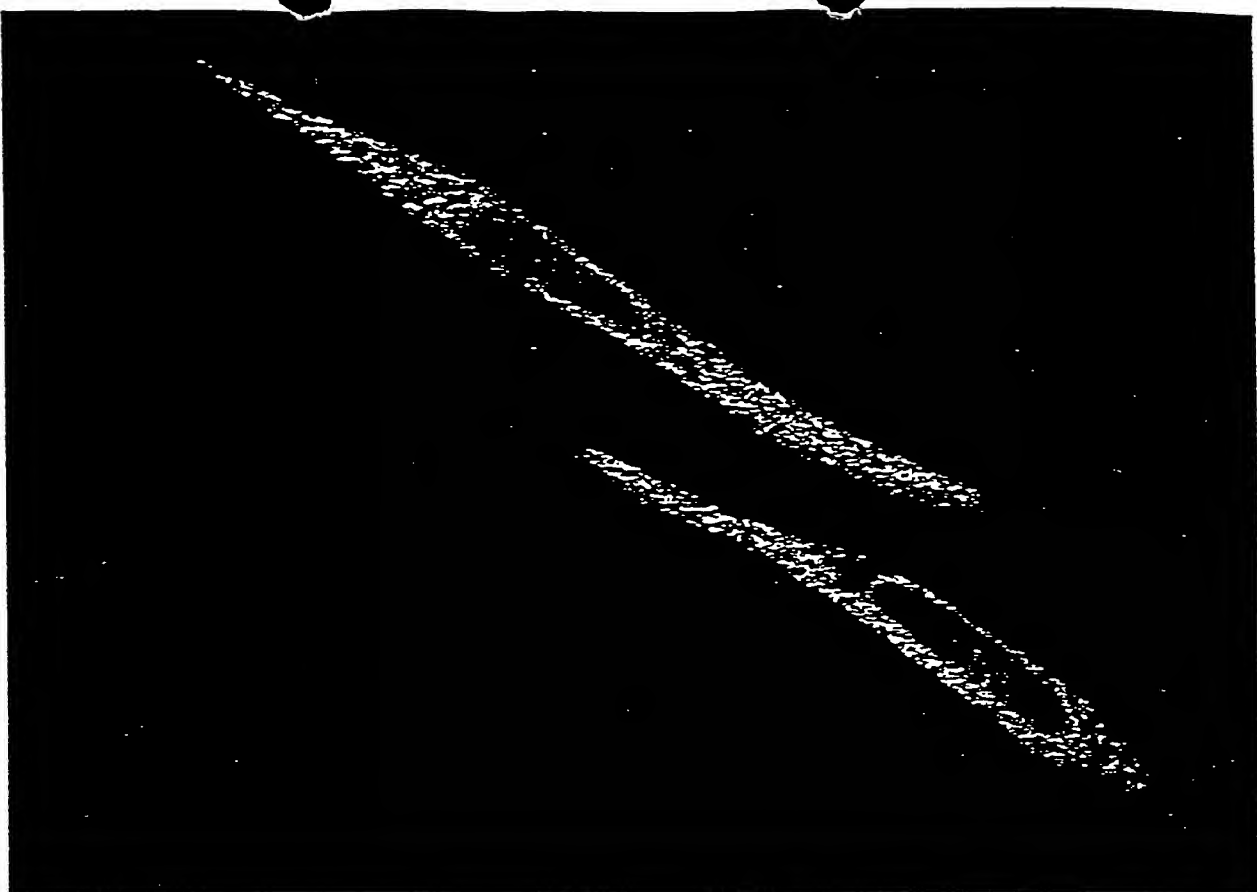


FIG. 15A



FIG. 15B

FIG. 15A and 15B are photomicrographs of the same specimen taken at different focal planes.